

## AMENDMENTS TO THE CLAIMS

The claims in this listing will replace all prior versions, and listings, of claims in the application.

### Listing of Claims

1. (Cancelled).
2. (Previously Presented) The solid-state imaging apparatus according to claim 9,  
wherein incident light is collected in a center of a plane made of said plurality of light-transmitting films, the incident light being incident at an angle asymmetrical to a center of a plane made of said plurality of light-transmitting films.
3. (Previously Presented) The solid-state imaging apparatus according to claim 9,  
wherein an amount of phase change of the incident light,  $\phi(x)$ , depends on a distance  $x$  in an in-plane direction and approximately satisfies the following equation,  
$$\phi(x) = Ax^2 + Bx \sin \theta + 2m\pi$$
  
wherein  $\theta$  is an incident angle of the incident light,  $A$  and  $B$  are predetermined constants, and  $m$  is a natural number.
4. (Previously Presented) The solid-state imaging apparatus according to claim 9,  
wherein  
$$\Delta n(x) = \Delta n_{\max} [\phi(x) / 2\pi + C]$$
  
is satisfied, where  $\Delta n_{\max}$  is a difference of refractive indices between one of said plurality of

light-transmitting films and a light-incoming side medium,  $\Delta n(x)$  is a difference of refractive indices between another one of said plurality of light-transmitting films and the light-incoming side medium at a position  $x$ , and  $C$  is a constant.

5. (Previously Presented) The solid-state imaging apparatus according to claim 9,  
wherein heights of said plurality of light-transmitting films are constant in a direction normal to said plurality of light-transmitting films.
6. (Previously Presented) The solid-state imaging apparatus according to claim 9,  
wherein each of said plurality of light-transmitting films includes one of  $\text{TiO}_2$ ,  $\text{ZrO}_2$ ,  $\text{Nb}_2\text{O}_5$ ,  $\text{Ta}_2\text{O}_5$ ,  $\text{Si}_3\text{N}_4$  and  $\text{Si}_2\text{N}_3$ .
7. (Previously Presented) The solid-state imaging apparatus according to claim 9,  
wherein each of said plurality of light-transmitting films includes one of  $\text{SiO}_2$  doped with B or P, that is Boro-Phospho Silicated Glass, and Teraethoxy Silane.
8. (Previously Presented) The solid-state imaging apparatus according to claim 9,  
wherein each of said plurality of light-transmitting films includes one of benzocyclobutene, polymethymethacrylate, polyamide and polyimide.
9. (Currently Amended) A solid-state imaging apparatus comprising arranged unit pixels, each of which includes a light-collector and a light-receiver,  
wherein said light-collector comprises:

a substrate into which incident light is incident; and

above said substrate, a plurality of light-transmitting films are formed in a region into which the incident light is incident,

wherein [[a]] each light-transmitting film of said plurality of light-transmitting films forms a zone having a width which is equal to or shorter than a wavelength of the incident light,

wherein each zone shares a center point which is located at a position displaced from a center of said light-receiver, and

said plurality of light-transmitting films form an effective refractive index distribution represented by a quadratic curve expressed by a distance from a center of a corresponding one of the unit pixels,

wherein, in a unit pixel, among said unit pixels, which is located at a center of a plane on which said unit pixels are formed, a position at which an effective refractive index distribution of a corresponding light-collector represented by the quadratic curve reaches a maximum value matches a central axis of a corresponding light-receiver, and

wherein in a unit pixel, among said unit pixels, which is located at a periphery of the plane, a position at which the effective refractive index distribution of a corresponding light-collector represented by the quadratic curve reaches a maximum value is displaced from the central axis of a corresponding light-receiver toward the center of the plane.

10. (Previously Presented) The solid-state imaging apparatus according to claim 9,

wherein an off-centered light-transmitting film is formed in an area shared by one light-collector and another light-collector in an adjacent unit pixel.

11. (Previously Presented) The solid-state imaging apparatus according to claim 9, comprising:

a first unit pixel for a first color light out of the incident light; and

a second unit pixel for a second color light which has a typical wavelength that is different from a typical wavelength of the first color light;

wherein said first unit pixel includes a first light-collector , and

said second unit pixel includes a second light-collector, in which a focal length of the second color light is equal to a focal length of the first color light in said first light-collector .

12. (Previously Presented) The solid-state imaging apparatus according to claim 9,

wherein a focal point is set at a predetermined position by controlling an effective refractive index distribution of said light-transmitting film.

13. (Previously Presented) The solid-state imaging apparatus according to claim 9,

wherein each of said unit pixels further includes a light-collecting lens on a light-outgoing side of said light-collector .

14. (Previously Presented) The solid-state imaging apparatus according to claim 9,

wherein an effective refractive index distribution of said light-transmitting film is different between light-collectors of said unit pixels located at the center of said plane on which said unit pixels are formed and light-collectors of said unit pixels located at the periphery of the plane.

15. (Cancelled).

16. (Previously Presented) The solid-state imaging apparatus according to claim 9,  
wherein each of said plurality of light-transmitting films of one of said unit pixels  
located near the center of an imaging area has a line width different from a line width of each of  
said light-transmitting films of one of said unit pixels located at the periphery of the imaging  
area and is located at a same relative position in said light-collector as a position of each of said  
light-transmitting films of the one of said unit pixels located near the center of the imaging area,  
the imaging area being a plane area on which said unit pixels are formed, and

a sum of line widths of said plurality of light-transmitting films of the one of said unit  
pixels located near the center of the imaging area differs from a sum of line widths of said  
plurality of light-transmitting films of the one of said unit pixels located at the periphery of the  
imaging area.

17. (Previously Presented) The solid-state imaging apparatus according to claim 16,  
wherein each of said plurality of light-transmitting films of the one of said unit pixels  
located at the periphery of the imaging area has a line width shorter than a line width of each of  
said light-transmitting films of the one of said unit pixels located near the center of the imaging  
area and is located at a same relative position in said light-collector as a position of each of said  
light-transmitting films of the one of said unit pixels located at the periphery of the imaging area.

18. (Previously Presented) The solid-state imaging apparatus according to claim 9,  
wherein each of said plurality of light-transmitting films of one of said unit pixels

located at the periphery of an imaging area has a line width shorter than a line width of each of said light-transmitting films of one of said unit pixels located near the center of the imaging area and is located at a same relative position in said light-collector as a position of each of said light-transmitting films of the one of said unit pixels located at the periphery of the imaging area, the imaging area being a plane area on which said unit pixels are formed.

19. (Canceled).

20. (New) The solid-state imaging apparatus according to claim 9,

wherein said light-collector comprises a concentric ring structure including a plurality of divided areas, each formed of a pair of a high refractive index material zone and a low refractive index material zone, and

wherein in each of said unit pixels,

a predetermined divided area of the plurality of divided areas has a width that is a same as a width of a concentrically outer divided area, and

a width of the high refractive index material zone of the predetermined divided area is wider than a width of the high refractive index material zone of the concentrically outer divided area.